

RESEARCH AND PRACTICE

More Money, Fewer Lives: The Cost Effectiveness of Welfare Reform in the United States

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Aid to Families with Dependent Children (AFDC) was the primary cash assistance program in the United States until 1996.¹ In that program, participants could receive cash assistance indefinitely. However, some policymakers questioned the logic of paying able-bodied citizens indefinitely because welfare might serve as an incentive to stay out of the workforce. These concerns were heard, and a number of randomized controlled trials were conducted in multiple states to test the effect of time limits for welfare benefits.²

These randomized controlled trials found not only that time limits to cash assistance incentivized participants to move into the workforce, but also that they produced increases in earnings relative to traditional AFDC.^{2,3} Ultimately, these experiments contributed to the passage of the Personal Responsibility and Work Opportunity Reconciliation Act in 1996.¹ This act was perhaps one of the most sweeping US policies enacted within the past 2 decades and one of the few large-scale policies to be passed on the basis of a large and convincing body of scientific evidence.^{1,4}

This act ended the federal guarantee of income support to poor families, replacing AFDC with a program called Temporary Assistance to Needy Families (TANF). Under TANF, states were given block grants along with relative autonomy over many aspects of welfare policy. Thus, TANF was implemented differently in different states, with some states offering much more generous benefits than others.⁵ The time limits in TANF were accompanied by incentives for work, such as earnings disregards (allowing recipients to remain on welfare even while earning money) and, in some instances, job training. As a result of TANF, welfare rolls have plummeted, saving taxpayer money and increasing family earnings.⁶

However, despite these net benefits, both the early randomized controlled trials and later

Objectives. We evaluated the economic benefits of Temporary Assistance to Needy Families (TANF) relative to the previous program, Aid to Families with Dependent Children (AFDC).

Methods. We used pooled mortality hazard ratios from 2 randomized controlled trials—Connecticut Jobs First and the Florida Transition Program, which had follow-up from the early and mid-1990s through December 2011—and previous estimates of health and economic benefits of TANF and AFDC. We entered them into a Markov model to evaluate TANF's economic benefits relative to AFDC and weigh them against the potential health threats of TANF.

Results. Over the working life of the average cash assistance recipient, AFDC would cost approximately \$28 000 more than TANF from the societal perspective. However, it would also bring 0.44 additional years of life. The incremental cost effectiveness of AFDC would be approximately \$64 000 per life-year saved relative to TANF.

Conclusions. AFDC may provide more value as a health investment than TANF. Additional attention given to the neediest US families denied cash assistance could improve the value of TANF. (*Am J Public Health.* 2015;105:324–328. doi:10.2105/AJPH.2014.302235)

studies of the real-world impacts of TANF showed that some participants—almost all of whom were single women with children—were simply unable to get jobs.^{2,7} Risk factors for unemployment after the expiration of time limits may have included large family size, the presence of young children at home, or mothers who have a mental or physical disability.^{5,8–10} Those who could not garner employment after their time limits expired often had to rely on friends and family for survival.^{2,7,9,10}

Moreover, the earlier trials that uncovered these problems almost always coupled time limits with extensive benefits (such as child care) that are not provided under TANF in the vast majority of states today. As welfare rolls declined, states tended to spend the extra funds left over in their federal block grants on other, often unrelated programs.⁷ Therefore, one might expect more adverse outcomes in the real-world implementation of TANF than in the early randomized controlled trials. Fortunately, because states implemented TANF in different ways, these impacts were possible to

study in a quasi-experimental manner. Studies exploiting spatiotemporal variations in implementation of time limits in the real world have shown similar benefits to the earlier randomized controlled trials,^{2,6,11,12} but also similar harms.^{7,10,13}

Specifically, TANF enrollees with preschool-aged children or larger families are both more likely to be food insecure and, at least among those required to enter the workforce quickly, in poorer mental health.^{7,9,10,14} Spatiotemporal analyses have suggested that time limits imposed under TANF were also associated with an overall increase in infant mortality.¹³ Long-term follow-up data from one such trial, Connecticut Jobs First (CJF), subsequently showed that treatment produced a nonsignificant 13% increase in mortality among all recipients and a nonsignificant 54% increase in mortality among women with more than 2 children.¹⁵ In the Florida Transition Program (FTP), treatment with time limits produced a 16% increase in mortality hazards.¹⁶ Whether this increase was statistically significant depended on the model specification. Taken together, these

data suggest that women with smaller families and who are able-bodied are better off under TANF than AFDC. However, women who cannot work because of disability or family obligations may have been better off with respect to health and longevity under AFDC than TANF. This hypothesis is supported by evidence that many women shifted from TANF to Supplemental Security Income, the program responsible for providing disability payments.¹⁷

Despite its overall benefits, TANF is a program for which the nonpartisan US Government Accountability Office has pointed out that reform is needed, particularly with respect to provisions for those who are unable to work (e.g., because of caregiving responsibilities or poor mental or physical health).⁷ Although many experts have felt that TANF has been a success when evaluated on the basis of mean monetary and social impacts, we asked whether TANF retains its value when adverse health impacts are assessed.

METHODS

We built a simple Markov model that was designed to evaluate the economic benefits of TANF relative to AFDC and to then weigh these benefits against its potential health threats. We assumed that the societal benefits of TANF included (1) reduced taxation (and thus reduced deadweight loss, or inefficiencies that arise when money is transferred from taxpayers to the government) attributable to reduced numbers of cash assistance recipients and (2) increased average family earnings. AFDC's benefits include increased longevity for mothers and their children. The major assumptions associated with this approach are presented in the box on the next page. We tested these assumptions in a series of sensitivity analyses. The analytic horizon is the 46 years of follow-up between ages 18 and 65 years, the age at which participants become eligible for Social Security and Medicare. We adopted the societal perspective and adjusted all costs to constant 2013 dollars using the nonmedical portion of the Consumer Price Index.

Data

Health and mortality. We used a mortality hazard ratio estimated from 2 randomized

controlled trials—CJF and FTP—of a welfare reform program, which had follow-up from the early to mid-1990s through December 2011. Although our research team was involved in the mortality analyses of CJF and FTP, the identifiers from the data for both of these studies are closely protected by state agencies. As a result, we were unable to obtain approvals to combine the datasets on a single server and then analyze them as one. We therefore combined mortality hazard ratios using a DerSimonian-Laird random-effects model.

We populated our models with age-specific data from US life tables and estimated increased mortality risk using the average hazard ratio associated with time limits in CJF and FTP.^{15,16,22} We obtained the additional impacts of infant mortality from the literature.¹³ We applied this increase in infant mortality to our hypothetical cohort of 5 million families with projected life expectancy for each infant of roughly 76 years.²³ On the basis of an observed annual birth rate of 0.15 per year for women enrolled in TANF, we estimated the total years of life lost to excess infant mortality to be 0.001 year per TANF recipient per year over her reproductive life (through age 50 years). We could not estimate depression impacts, if any, of TANF, and therefore did not include them.¹⁴

Cost. We assumed TANF produces cost savings in 2 major ways.⁶ First, it decreases caseloads, thereby reducing deadweight loss associated with cash assistance.²⁴ Second, it increases recipients' family income (the earnings of everyone in the household less welfare benefits), thereby producing net societal benefits. We obtained deadweight loss estimates from the economics literature.²⁴

The overall costs of TANF are known (both with respect to the amount directly spent on cash assistance and the amount transferred to the states via block grants). However, the deadweight loss estimate itself is uncertain.²⁴ In addition, although caseloads have dropped precipitously under TANF, federal outlays for block grants have dropped only slightly.⁷ The excess funds are generally spent on other government programs (also subject to deadweight loss).^{7,20} Our model was run under the assumption that the alternative expenditures under TANF block grants would have

occurred without the federal transfers. It was then run again with reductions in block grants alone.

With respect to gains in family income associated with TANF, estimates of benefits vary largely.²⁵ Estimates of increased household earnings (both directly by participants and by increases in marriage rates) range from losses to 25% improvements.^{11,25} We used an overall estimated improvement in family income of \$879 for a family with 2 children, a value based on a difference-in-differences approach across states. We then tested it over ranges described in the literature.^{6,11,25}

The overall cost of AFDC relative to TANF was obtained from the US Department of Health and Human Services.²⁶ We used the cost and caseload of AFDC in 1994 as a baseline because it represented the last year for which AFDC was fully in effect. We used the total expenditures of federal TANF money, the percentage spent on cash assistance, and caseloads for TANF in 2011, the last year for which we had data.

Analyses

We conducted our analyses using Excel 2011 for Macintosh (Microsoft Corporation, Redmond, WA) and TreeAge 2014 (TreeAge Software, Williamstown, MA). We modeled impacts only for eligible adult women (not their children) who enroll in welfare (either TANF or AFDC depending on the model arm) at age 19. Our spreadsheet and Markov models therefore simply compared the net present value of societal costs and deaths for the average 18-year-old female recipient from 2011 through 2075—the point at which the participant will have reached retirement age.

To obtain these estimates for TANF recipients, we used mean annual changes in family income as benefits in the numerator. We also applied mortality hazards to age-specific mortality rates and tally discounted infant mortality impacts to the denominator. To the AFDC cohort, we added annual deadweight losses. Model inputs and ranges are presented in Table 1.^{6,11,15,16,25} We did not use entry or exit dynamics in the model because these are averaged out in the cost and caseload

Major Assumptions Associated With the Markov Decision Analysis Model Comparing Cash Assistance Provisions Under TANF With Provisions Under AFDC

1. Cash assistance has been linked to reduced marriage rates.^{2,18} We assumed that the harms or benefits associated with increases in marriage rates under TANF were captured by measured changes in household income under TANF relative to AFDC.
2. We assumed that the increases in mortality seen across all experimental sites in Connecticut and Florida were generalizable to current-day recipients of TANF-funded assistance. This assumption may have underestimated real-world mortality impacts because both experiments provided more benefits than TANF,² the analyses used an intent-to-treat approach, and both the treatment and control groups received the presumably harmful treatment after 2000.^{15,16}
3. For the sake of comparison, we assumed that if TANF had not been enacted, caseloads today would be similar to what they were in 1993–1995. Caseloads steadily increased through 1994 and then showed a slight decline in 1995 and 1996.¹⁹ This assumption implies that the cyclic economic effects on caseloads—including the technology boom of the 1990s and the Great Recession—would be averaged out.
4. Under TANF, states were given block grants. As caseloads dropped, the block grants were spent on a wide array of other programs. We assumed that savings associated with reduced caseloads displaced other state obligations and therefore reduced deadweight loss associated with taxation.²⁰
5. Time limits to welfare did not impact family size.²¹

Note. AFDC = Aid to Families With Dependent Children; TANF = Temporary Assistance to Needy Families.

values. Because we evaluated a single cohort of women, we estimated excess life-years lost to infant mortality using the product of

a single year of infant mortality and the average number of children born to recipients under TANF.

RESULTS

The box on this page lists the major assumptions of the models, and Table 1 lists the model inputs. From the societal perspective, our concern is with the cost of a program, regardless of who pays. Over the working life of the average cash assistance recipient, AFDC would cost approximately \$28 000 more than TANF from the societal perspective. However, it would also bring 0.44 additional years of life. The resulting incremental cost effectiveness of AFDC relative to TANF is therefore approximately \$64 000 per life-year saved (Table 2).

These figures were sensitive to some model assumptions, however (Table 3). In one-way sensitivity analyses, deadweight loss estimates did not produce much variance in the incremental cost-effectiveness ratios. However, if the marginal family income gains were equal to the highest estimate in the literature, the incremental cost effectiveness of AFDC would drop to \$262 000 per life-year saved. Infant mortality impacts produced very little influence on the model. However, if mortality impacts on mothers are nil, then the cost of AFDC soars to \$1.1 million per life-year saved (based on infant mortality impacts alone). In 2-way sensitivity analyses comparing the hazard ratio with infant mortality, infant mortality exerted only 0.3 percentage points of influence on the model's incremental cost-effectiveness ratio (data not shown).

TABLE 1—Model Inputs Used in the Analysis Comparing AFDC and TANF: Connecticut Jobs First, Connecticut, 1996–2011, and Florida Transition Program, Florida, 1994–2011

Variable	Baseline	High	Low
Cost of AFDC (1994, in 2013 dollars) ^a	17 874 000 000	...	...
Deadweight loss estimator, ^b %	32	52	16
Caseload			
1994 (AFDC baseline) ^a	5 046 326	...	...
2011 (TANF baseline) ^a	1 864 187	...	...
TANF impacts			
Marginal earnings, ^c %	5	25	0
Family income, 2013, ^{a,d} \$	19 530	...	...
Marginal family income, ^e \$	878.85	4 883	0
Marginal annual savings/recipient, ^f \$	1 298	5 301	419
Hazard ratio ^g	1.16	1.32	1.00
Excess infant deaths/birth ^h	0.0005	0.0007	0.0004
Births/enrolled woman/year (aged 15–50 y) ^a	0.1550	...	...
Years of infant life lost/woman/year	0.0012	0.0016	0.0009

Note. AFDC = Aid to Families With Dependent Children; TANF = Temporary Assistance to Needy Families.

^aBased on actual numbers, so no high or low value was used.

^bBoth the baseline and sensitivity estimates are based on a seminal economics paper.²⁴

^cBaseline and high and low extremes were obtained from a review of the literature.^{2,7,9–11,20,25}

^dCalculated as the product of the marginal family income for a family of 3 and the percentage increase in marginal earnings under TANF.

^eThe product of the marginal increase in earnings and the total family income for 1 year.

^fBased on increased earnings and reduced deadweight loss.

^gBased on a meta-analysis of the Connecticut Jobs First program and Florida Transition Program. The high value represents a plausible upper bound of 2-fold impacts considering that treatment stopped in 2000, but participants were followed through 2011 and that the results are based on an intent-to-treat analysis. The low value assumes that there was no impact, which is plausible given that the meta-analysis is nonsignificant if less rigorous sites are excluded and clustering is removed from the models.

^hBased on a spatiotemporal study of infant deaths.¹³

TABLE 2—Cost, Effectiveness, and Incremental Cost-Effectiveness Ratio (ICER) of TANF Relative to AFDC: Connecticut Jobs First, Connecticut, 1996–2011, and Florida Transition Program, Florida, 1994–2011

Strategy	Cost, \$	Incremental Cost, \$	Effectiveness, Life-Years	Incremental Effectiveness	ICER, \$
TANF	0	0	22.00	0.00	0
AFDC	28 161	28 161	22.44	0.44	64 094

Note. AFDC = Aid to Families With Dependent Children; TANF = Temporary Assistance to Needy Families.

DISCUSSION

Welfare reform may have produced very large direct monetary savings, including returns for both individuals and for the US government.^{6,11,25} However, TANF may also harm women who could not subsequently work (whether as a result of young children at home, large family size, or mental or physical illness). Some may have ended up relying on weak financial networks or become homeless.^{2,7,9,10} Given that higher earnings and employment are thought to be beneficial for health, the observed adverse impacts on the mothers and their children likely occurred solely among these women who could not work and therefore lost their welfare benefits.^{13–16,27,28} In this article, we asked whether, based on the mean cost and caseload data of AFDC in 1994, it would still have

been more cost effective to instead subject those AFDC families to TANF today.

We found that AFDC would cost roughly \$64 000 per life-year gained.²⁹ In terms of life-years saved, this is roughly in line with many social interventions in which the government chooses to invest.³⁰ Examples include emergency floor lighting in airplanes, collapsible steering columns in cars, and airbags in cars. Smoke detectors in homes (at \$210 000/life-year saved) roughly correlate with our high estimate of returns on marginal family incomes associated with TANF.³⁰ However, few health programs reserve standards as low as \$1.1 million per life-year saved (our estimated incremental cost-effectiveness ratio when only infant mortality is included), with such expensive measures generally reserved for aviation and nuclear safety.³⁰ Thus, if the estimates of mortality hazards among mothers are nil, then TANF is likely more cost beneficial on the whole than AFDC.

Despite its benefits, TANF is a program for which the US Government Accountability Office has pointed out that reform is needed.⁷ For example, the program is not responsive to economic downturns, some states are increasingly reducing cash assistance rolls to meet other budget priorities, and overall block grants are falling over time. Finally,^{7,25} although some families benefit, those who cannot work because of mental or physical limitations may increasingly be excluded from the program because they, like able participants, face time limits. Unfortunately, the main disability program, Supplemental Security Income, is also in need of reform and is struggling under higher caseloads even as TANF caseloads decline.¹⁷ Private disability insurance is highly variable and is ironically more prevalent and of a higher quality among higher income workers than among lower wage earners.

As with any social policy, changes to TANF would likely have unforeseen macroeconomic consequences.³¹ For one, it may produce budget deficit impacts that influence interest rates, economic ratings, and investor perceptions of the US economy. Second, the other national and local safety net programs that have been partially accommodating unemployed former TANF recipients are in an unprecedented state of flux and transition.³² Families enrolled in TANF often receive Medicaid and Supplemental Nutritional Assistance Program benefits. Some states have resisted increasing Medicaid enrollment under the Patient Protection and Affordable Care Act, and the future of Supplemental Nutritional Assistance Program was unclear at the time this article was written. The extent to which TANF modifications would impact these dynamics within the US political economy is unknown and well beyond the scope of this article. Future work could include systems dynamics models, which allow for the broader impacts of a given social policy on health and economic well-being to be modeled over time. Third, to the extent that such modifications would reduce mortality, they may also have an impact on morbidity and therefore produce intangible benefits (e.g., on the well-being of mothers and their children) and costs (e.g., Medicaid enrollments and Social Security payments).^{23,33} In sum, government regulatory programs are extensive and expensive and can sometimes be contradictory, so simple comparisons based on incremental cost-effectiveness ratios should be viewed in the larger context of regulatory practices.³⁴

Our study had several strengths. Foremost, we used real-world cost data and derived mortality data from a meta-analysis of 2 multicenter randomized controlled trials with mortality follow-up over nearly 2 decades. Despite these strengths, the study had a number of important limitations. For one, none of the randomized controlled trials of welfare reform that we examined included a measure of quality-adjusted life-years. Thus, we could not incorporate morbidity impacts in our study. Second, we based our mortality estimates on randomized controlled trials in various locations in 2 states, Connecticut and Florida. Although these states fall roughly in the middle range of benefits offered by states

TABLE 3—Sensitivity Analyses Comparing AFDC and TANF: Connecticut Jobs First, Connecticut, 1996–2011, and Florida Transition Program, Florida, 1994–2011

Baseline	High	Low
Deadweight loss estimator	77 000	54 000
Marginal family income	262 000	21 000
Hazard ratio	34 000	1 100 000
Years of infant life lost/woman/year	63 000	68 000

Note. AFDC = Aid to Families With Dependent Children; TANF = Temporary Assistance to Needy Families. Each value represents the incremental cost-effectiveness ratio (in 2013 dollars per life-year gained) when the high and low values from Table 1 were input into the model.

under TANF, these results might not be generalizable to the nation as a whole. Third, the experiments included much more generous benefits than TANF in most states, and participants and controls were both treated with TANF roughly halfway through the follow-up period. Both of these factors likely resulted in an underestimation of mortality hazards.

It is important to note that when clustering is removed from the FTP model, the confidence intervals widen, and the results become only marginally significant.³⁵ Whether clustering should be added to the model under these circumstances is debatable because the number of sites in FTP was limited to 2 (or 5, depending on the locations included). The clustered meta-analysis is statistically significant; however, the meta-analysis without clustering of CJF and FTP is only statistically significant when all sites are included.

If the adverse health impacts of TANF arise because some women cannot work, reform efforts should focus on this subgroup of recipients. Reform of the disability system could include the use of specially trained physicians for disability assessments. Given that women with large families appear to be disproportionately affected,^{9,10,15} redoubled family planning efforts and child care investments could also help. Current efforts to plan a universal prekindergarten program could simultaneously provide respite for mothers and cognitive enhancements for children.³⁶ Such a system could produce the win-win policy that TANF was originally intended to be. ■

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Contributors

P. Muennig conceptualized the study, designed the Markov models, contributed data, and led the publication efforts. R. Caleyachetty conducted the meta-analysis, contributed to the development of the article, and contributed to data collection efforts. Z. Rosen led project administration and contributed to the development of the article. A. Korotzer made major contributions to the framing and development of the article.

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Human Participant Protection

This study involved only secondary analysis of published data and was exempt from institutional review board review.

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